causing almost no reflections. However, the light transmittance of a resistive-film touch panel is so low that the display illumination of the LCD becomes dark. With the touch panel **600** in accordance with the sixth embodiment, on the other hand, a bright screen having no reflections can be realized with a SAW touch panel having high light transmittance.

Seventh Embodiment

[**0063**] **FIG. 10** is a section view of a touch panel in accordance with a seventh embodiment. In **FIG. 10**, the same components as those of the foregoing embodiments are denoted by the same reference numerals as the corresponding ones of the foregoing embodiments, and explanation of them will be omitted in the following description. The touch panel **700** in accordance with the seventh embodiment has a polarizing plate **701**, instead of the transparent resin film **4** of the touch panel **200** in accordance with the second embodiment.

[**0064**] Dot spacers **702**, dike protrusions **703**, and second protrusions **704** are formed on the substrate-facing surface of the polarizing plate **701** by a printing process, and the polarizing plate **701** is then attached to the glass substrate **2**. Like the dike protrusions **201** of the second embodiment, the dike protrusions **703** are formed in the outer peripheral regions on the substrate-facing surface of the polarizing plate **701** that are not to touch the transducers **3**.

[**0065**] Like the second protrusions **202** of the second embodiment, the second protrusions **704** are formed in the inner peripheral regions on the substrate-facing surface of the polarizing plate **701** that are not to touch the transducers **3**. Here, the second protrusions **704** are situated closer to the glass substrate **2** than the dot spacers **702** to the glass substrate **2**.

[**0066**] As the touch panel **700** of the seventh embodiment does not include a transparent resin film, the light transmittance is increased. Accordingly, the brightness of the display screen that is seen through the touch panel can be further increased.

Eighth Embodiment

[**0067**] **FIG. 11** is a section view of a display device in accordance with an eight embodiment. In **FIG. 11**, the same components as those of the foregoing embodiments are denoted by the same reference numerals as the corresponding ones of the foregoing embodiments, and explanation of them will be omitted in the following description. The display device **800** in accordance with the eighth embodiment has the touch panel **700** of the seventh embodiment formed on the outer surface of an upper glass substrate **801** of a liquid crystal display (LCD) panel **804**. More specifically, the SAW transmitting/receiving transducers **3** are formed on the outer surface of the upper glass substrate **801** of the liquid crystal display panel **804**, so that a liquid crystal panel and a touch panel are integrated into one device.

[**0068**] A polarizing plate **802** that is essential for a liquid crystal display panel is placed over the upper glass substrate **801** of the liquid crystal display panel **804** having the transducers **3** formed in the outer peripheral regions, with a predetermined distance being kept between the polarizing plate **802** and the upper glass substrate **801**. In this manner, an integrated display device that is equipped with a touch panel is realized. As a touch panel is placed over the outer surface of a liquid crystal panel, a thinner integrated display device that is equipped with a touch panel can be realized in accordance with the eighth embodiment.

Ninth Embodiment

[**0069**] **FIG. 12** is a section view of a display device in accordance with a ninth embodiment. The display device **900** in accordance with the ninth embodiment is an integrated display device that is equipped with a touch panel and has an EL display panel **903** containing EL elements **902** on the bottom surface of a glass substrate **901** having the SAW receiving/transmitting transducers **3**. In the display device **900**, the transparent resin film **4** is placed over the outer surface of the glass substrate **901**, with a space layer being interposed in between.

[**0070**] The display device **900** is produced in the following manner. Lower electrodes formed by Al thin films, and piezoelectric layers formed by ZnO films are provided on one surface of the glass substrate **901**, and comb-like electrodes formed by Al thin films are further stacked on the piezoelectric layers to form the SAW receiving/transmitting transducers **3**. The EL elements **902** are then formed on the other surface of the glass substrate **901** with the transducers **3** by an ink jet technique, a photopolymer technique, or the like.

[**0071**] The outer peripheral regions of the transparent resin film **4** are bonded to the EL display panel **903**, which has the SAW touch panel produced in the above manner, with the double-faced adhesive tape **203** of a predetermined thickness.

[**0072**] As a touch panel is stacked on the outer surface of an organic EL display, an EL display device that is equipped with a touch panel capable of accurate position detection can be provided in accordance with the ninth embodiment.

[**0073**] If any of the above embodiments is applied to a conventional SAW touch panel, especially, a compact, thin device for mobile equipment, the shock resistance can be improved. Also, even if a touch panel is broken by impact, glass fragments can be prevented from scattering. Further, a touch panel that does not carry out erroneous input even when a drop of water or oil adheres to the surface can be realized.

[**0074**] Although a few preferred embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

What is claimed is:

1. A touch panel comprising:

a transparent substrate on which surface acoustic waves are propagated;

a transmission/reception unit that is formed in peripheral regions on the transparent substrate, each two of the peripheral regions facing each other, and transmit and receive the surface acoustic waves;

a detecting unit that detects the location of an object touching a predetermined operation area; and